CLAIMS

What is claimed is:

1. A method for simplifying the control of flow of a fluid in a fuel processor, the method comprising the steps of:

determining, from among a plurality of inputs for the fluid in the fuel processor, a first fluid input which requires the greatest precision of control of the rate of fluid flow;

regulating the rate of fluid flow at the first input based upon feedback from a sensor associated with the first fluid input, wherein such regulation occurs with a first time constant; and

regulating the rate of fluid flow at each of the remaining inputs based upon feedback from at least one sensor so that the flows satisfy at least one criterion selected from:

i) having a regulatory time constant that is at least about three times greater than the time constant of regulation of the first flow; and

ii) having a flow volume that is less than about 10% of the average flow volume of the fluid at the first input.

2. The method of claim 1 wherein the fluid comprises air, and the rate of fluid flow at the first input is regulated by controlling a compressor coupled to the first input.

3. The method of claim 2 wherein the first input flow comprises air for providing heat for a fuel reforming reaction.

4. The method of claim 2 wherein the first input flow comprises air for a combustor or burner that supplies the heat required to reform fuel in a fuel reformer selected from a partial oxidation reformer (POX), an autothermal reformer (ATR), and a "pure" steam reformer.

5. The method of claim 1 where the fluid comprises a gaseous or liquid fuel, and the input is supplied by one of a fuel compressor and a fuel pump.

6. The method of claim 1 wherein the fluid comprises liquid or gaseous water.

7. The method of claim 1 wherein the regulatory time constant for the remaining inputs is at least about five times greater that the time constant of the first input.

8. The method of claim 1 wherein the regulatory time constant for the remaining inputs is at least about ten times greater that the time constant of the first input.

9. The method of claim 1, wherein the flows of at least one fluid can be entered into a control algorithm without requiring coupling of the flows to each other in the computations required to control the system.

10. A fuel processor comprising:

a fuel reforming unit having a fluid inlet for varying the rate of input of a fluid;

a hydrogen-cleanup unit having a fluid inlet for varying the rate of input of the fluid;

a fluid conduit for providing the fluid to a fuel cell, the fluid conduit having a fluid inlet for varying the rate of input of the fluid;

a control system which determines, from among the fluid inlets of fuel reforming unit, the hydrogen-cleanup unit, and the fluid conduit for the fuel cell, a first fluid inlet which requires the greatest precision of control of the rate of input of the fluid, the control system regulating the rate of fluid flow at the first fluid inlet based upon feedback from a sensor associated with the first fluid inlet, wherein such regulation occurs with a first time constant, the

control system further regulating the rate of fluid flow at each of the remaining fluid inlets based upon feedback from at least one sensor so that the flows satisfy at least one criterion selected from: i) having a regulatory time constant that is at least about three times greater than the time constant of regulation of the first inlet; and ii) having a flow volume that is less than about 10% of the average flow volume of the fluid at the first inlet.

11. The fuel processor of claim 10, wherein the sensor associated with the first fluid inlet comprises a fluid flow rate sensor.

12. The fuel processor of claim 10 wherein the fluid is air.

13. The fuel processor of claim 12 wherein the control system varies the rate of fluid flow at the first inlet by controlling a compressor coupled to the first inlet.

14. The fuel processor of claim 13 wherein the air from the compressor is fed to a plenum, and from the plenum to a plurality of fuel processor components via at least one controllable valve.

15. The fuel processor of claim 14 wherein the first fluid inlet comprises an inlet to the fuel reforming unit.

16. The fuel processor of claim 15 wherein the rate of input of fluid to the fuel reforming unit is controlled by varying the output of the compressor.

17. The fuel processor of claim 16 wherein the rate of input of fluid to the hydrogen-cleanup unit and the fuel cell is controlled by adjusting valves associated with the hydrogen-cleanup unit and the fuel cell.

18. The fuel processor of claim 10 further comprising:

a tail gas combustor having a fluid inlet for varying the rate of input of a fluid, wherein the control system regulates the rate of fluid flow to the fuel reforming unit, the hydrogen-cleanup unit, the fuel cell, and the tail gas combustor.

19. The fuel processor of claim 10 wherein the fuel reforming unit comprises a partial oxidation reformer.

20. The fuel processor of claim 10 wherein the fuel reforming unit comprises an autothermal reformer.

21. The fuel processor of claim 10 wherein the fuel reforming unit comprises a pure steam reformer.

22. The fuel processor of claim 10 wherein the hydrogen-cleanup unit comprises at least one of a water gas shift reactor, and a preferential oxidation reactor.

23. The fuel processor of claim 10 wherein the fluid comprises water.

24. The fuel processor of claim 10 wherein the fluid comprises fuel.

25. The fuel processor of claim 10 wherein the control system varies the rate of fluid flow at the first inlet by controlling a pump coupled to the first inlet.